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ABSTRACT

This paper reports the results of a study which examined the longitudinal relationships between young children's classroom behavior and their performance on achievement tests. Subjects were 235 children who made up the first cohort to attend kindergarten in the public schools of North Carolina. Data were collected at four points: at the beginning and end of kindergarten, and at the beginning and end of grade one. Subjects' behavior factors of extraversion, social behavior, and task orientation were measured at the four points by the Schaefer-Aaronson Classroom Behavior Inventory. Their achievement performance at the end of grade one was measured on five subtests of the Stanford Achievement Test (word reading, paragraph meaning, vocabulary, word study skills, and arithmetic). Among the results, Pearson product moment correlations and multiple regression analysis revealed that of the three independent variables, task orientation had the strongest and the most consistent relationship to achievement. The relationship of extraversion to achievement, while strong at the beginning of the first grade, decreased by the end of the year. Discussion of these findings centered on the assertion that children low on reading achievement at the end of first grade are at risk at this time of being less extraverted, more hostile in their social behavior and less task oriented than when they began kindergarten. (Author/MP)

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CLASSROOM BEHAVIOR AND ACHIEVEMENT TEST PERFORMANCE AT THE KINDERGARTEN AND FIRST GRADE LEVEL

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Abstract

This study examined longitudinal relationships between (1) classroom behavior ratings producing factor scores for Extraversion, Social Behavior and Task Orientation at four points in children's school careers between kindergarten entrance and end of Grade One, and (2) achievement test performance at end of first grade. Pearson product moment correlations and multiple regression analysis were used to determine these relationships. N's ranged from 114 to 237. Results were consistent with earlier studies of this and other populations. At the beginning of school experience, Extraversion is important for later achievement Pearson r for Extraversion at the end of kindergarten and Reading achievement at the end of Grade One is .29 . At the end of first grade, however, Task Orientation has come to be even more highly correlated with achievement than Extraversion then: those r's are .46 and .38, respectively. Implications exist for improving school achievement, but also for avoiding damage to mental health: children low on achievement in reading are at risk for being less extraverted, socially positive and task oriented at the end of first grade than when they began kindergarten.

Classroom Behavior And Achievement Test Performance

At The Kindergarten And First Grade Levels

The purpose of this paper is to report on a study of the relationship between young children's classroom behavior and their performance on achievement tests. We will look at this relationship over a two year period with the same group of children. The data come from a total of 235 children* who made up the first cohort to attend kindergarten in the public schools of North Carolina. The evaluation of that program included measures of intellectual, social and emotional development as well as the level of stimulation in the home environment. Data were collected at the beginning of kindergarten (1969), the end of kindergarten (1970), the beginning of grade one (1970) and the end of grade one (1971). A description of this program and its evaluation appeared in two papers in 1973 (Landsberger, 1973 a and b).

This paper reports the analysis of the total group of scores focusing on (1) the behavior factors of Extraversion, Social Behavior, and Task Orientation, as measured at the four points in time noted above, by the Schaefer-Aaronson Classroom Behavior Inventory;** and (2) the achievement

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* -Of the 317 children who began kindergarten in the cohort, complete data for scores through the end of grade one necessary for the present study were available for only 235.

** -The Classroom Behavior Inventory (Schaefer and Aaronson, 1966) is a sixty item instrument used by teachers to rate the behavior of children on four-point scales. Each of the factors represents a bipolar scale which is a combination of two positive and two negative traits as follows:

Positive Traits	Factor	Negative Traits
Verbal Expressiveness and Gregariousness	Extraversion	Self-consciousness and Withdrawal
Kindness and Considerateness	Social Behavior	Irritability and Resentfulness
Concentration and Persistence	Task Orientation	Hyperactivity and Distractability

performance of these children as measured on five sub-tests of the Stanford Achievement Test at the end of grade one. Pearson product-moment correlations between the behavior and achievement measures constitute a part of the analysis. The remainder comes from the multiple regression analysis of performance on the Stanford Achievement subtests with the three classroom behavior factors.

The authors believe that out studies add substantially to what is now known about the relationships between children's behavior in their classrooms and their learning, as measured in this case by achievement tests. The present analyses were performed as a follow-up of the findings of an earlier study (Landsberger, 1976). The earlier results suggest that significant differences in classroom behavior beginning at kindergarten entrance existed for three groups of children with a subsequent divergence in reading achievement at the end of Grade One. The findings were as follows:

(1) Children who became good readers began kindergarten more task-oriented, more extraverted and more positive in social behavior than the average. As they went along, they pulled further and further ahead of their classmates.

(2) Exactly the opposite occured with non-readers. They began somewhat lower than fair readers, and even more below good readers. They fell to lower and lower positions as time went on. On all three behavior factors, their absolute scores at the end of first grade were lower than they had been at the beginning of kindergarten, despite a general rise in the Mean scores for the total cohort over time.

(3) Fair readers began and ended almost exactly at the mid-point of the cohort for all three of the behavior factors.

These results indicate possible relationships between different scores on the behavior factors, children's motivation, and the extents to which they involve themselves with and commit themselves to school activities and tasks. The findings further suggest that almost from the start, some children began to conform to school norms, and incorporated the goal of learning to read.

Their actually learning to read led to more Extraversion and more positive Social Behavior in classroom activities and interactions. These characteristics continued to bring reinforcements for task-oriented behaviors as well as reading activities, and a beneficial cycle was under way, building "Good Readers" by the end of first grade.

Conversely, children who rejected the school norms and the goal of learning to read (indicated by less Task Orientation) and who thereby failed to perform the reading activities, became less and less extraverted (more withdrawn) and less positive in social behavior. For them a cycle had been set in motion which produced non-readers at the end of first grade. Thus, reading is related dynamically to the child's acceptance of the goals of the classroom and to his general adjustment as reflected by all three behavior factor scores.

The above results were obtained through a process of selecting particular subgroups from the population of children. Therefore, we needed to analyze the total population of kindergarten children to determine the extent to which these were general relationships.

Analysis Of Behavior Factors And Achievement Relationships for the Cohort.*

As has been stated in the introductory paragraphs, the data relative to behavior and achievement measures have been analyzed by means of correlation and multiple regression analyses.

First the interscale correlations for the behavior factors will be examined. These correlations are presented in Table X. As is apparent,

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* The Stastical Package for the Social Sciences (SPSS) was employed for the analysis. Zero scores on behavior factors were not distinguished from missing information. Because scores on all three behavior factors range from -30 to +30, zero scores are not unusual. Therefore some legitimate scores were disallowed. For these reasons, the numbers ranged between 211 and 235 for the correlational analysis. The loss of data left an N of 114 with every item complete for the multiple regression analysis.

there is modest independence of the factors with the 224 children upon whose ratings these are based. The relation between Task Orientation and Social Behavior (r=.635) is considerably larger than the relation of either of these factors to Extraversion (r of .428 and .434 respectively). The amounts of variance explained in the case of Task Orientation-Social Behavior, i.e., the percent of the variance in common for those two factors, is 40 percent. It is 18 percent for Task Orientation-Extraversion and 19 percent for Social Behavior-Extraversion. Given the usual tendency toward halo effects and response-set of teachers who make ratings of children, this degree of independence speaks well for the Classroom Behavior Inventory as an instrument capable of stimulating teachers to respond differentially to different aspects of children's behavior in the classroom.

Table I about here

Although information is available for all subtests, and although there is variation in the size of the correlations from test to test, we shall focus here on the Paragraph Meaning correlations. This is done partly for the sake of simplification and partly to follow up on the relation of behavior factors to reading which had been identified earlier (Landsberger, 1976). Table II summarizes the correlations and percent of variance explained for all three behavior factors with the Paragraph Meaning subtest.

Table II about here

From Table II it is clear that there are only very tentative relationships at the beginning of kindergarten between behavior ratings and performance on the Paragraph Meaning subtest at the end of the first grade. The small positive relationship for Social Behavior is not large enough to be significant during all of kindergarten. However, there is an increase in the magnitude of the relationships as they progressed through kindergarten, .14 to .17. This is consistent with the significant increases which occur

for Extraversion, from .22 to .29 and for Task Orientation, from .24 to .39. These relationships between each behavior factor and Paragraph Meaning performance increase through the beginning of first grade. The relationships then decrease slightly at the end of first grade to .26 for Social Behavior and to .38 for Extraversion. Task Orientation maintains the highest relationship with Paragraph Meaning performance throughout. The correlation of .46 between Task Orientation at first-grade-beginning and Paragraph Meaning performance at the end of first grade is maintained at exactly the same level at the end of the year.

The same factors were analyzed using 114 children in a multiple regression analysis for both the beginning and end of first grade. The results using the beginning of the year behavior ratings as predictors, with the Stanford Achievement subtests as the criterion are presented in Table III. The analysis of the end of first grade ratings are presented in Table IV. For each subtest there is a multiple correlation for the behavior factors, together with the percent of variance explained, related to each factor separately.

Tables III and IV about here

In Table V the regression analysis for the Paragraph Meaning subtest is presented for the beginning-of-first-grade and end-of-first-grade behavior factor ratings. This comparison is an example of the shift which occurs in the behavior factors in predicting academic achievement. The Task Orientation factor came to be more closely related to performance on Paragraph Meaning than either of the other two factors, by the end of grade one. Extraversion is the factor with the closest relationship at the beginning of first grade to performance on Paragraph Meaning at first grade's end. By the end of the first grade the amount of variance explained (r^2) for Extraversion has decreased to only .06.

Table V about here

Discussion of Findings

The above analyses offer substantial support for the relationships suggested by the earlier Landsberger study of children at the extremes in reading achievement at first grade's end (1976). The relationships between eventual achievement and the behavioral factors increase from weak ones during the kindergarten year to much stronger relationships by the end of first grade. This supports the idea of the cycle which was hypothesized as operating between reading and the kinds of behavior measured the Classroom Behavior Inventory factor scales. The Paragraph Meaning subtest is interpreted by the authors as being the clearest single indication of true reading. It is Extraversion at the beginning of first grade which contributes heavily to the relationship between behavior and the performance on Paragraph Meaning, accounting for 20 percent of the variance when the multiple correlation accounts for 34 percent of the variance. At the end of the first grade, however, it is Task Orientation which is prominent, accounting for 23 percent of the variance when the multiple correlation accounts for 28 percent of the variance.

Through both the correlations and the regression analysis, Task Orientation seems to show the strongest and most consistent relationship to achievement. The relationship of Extraversion, while strong at the beginning of first grade, decreases by the end of that year.

These findings take on additional meaning when viewed in the context of previous studies reporting investigations at the early primary level of behavior factors and achievement. Closely related work is that of Martin Kohn and Bernice Rosman, James Stedman and Russell Adams, and that of Earl Schaefer, who developed the Behavior Inventory.

In the theoretical discussion where different roles for the factors are distinguished, Schaefer has proposed that the two factors of Extraversion and Social Behavior constitute "Adjustment" while Task Orientation, together with Intelligence, constitutes "Competence." The child's adaptation to the tasks and environment of school is made up of Competence and Adjustment (1975).

Schaefer reported on data from a study where he used a short 18-item form of the Classroom Behavior Inventory with a group of 70 children at the second and again at the fourth grade level. He computed correlations between the behavior ratings and a composite score from the Iowa Test of Basic Skills.* Reading performance was not analysed separately in that study. The correlations with Social Behavior were generally lower than for the other two factors at the second and fourth grade levels. His results support, at least as strongly as our findings, the relationship between Task Orientation and achievement in general.

The 60-item Classroom Behavior Inventory employed in our study was used by Stedman and Adams in a study of children whose behavior was rated only once, during their summer in a Head Start program (1972). Stedman and Adams correlated these behavior scores with reading achievement at the end of first grade. The 76 children for whom all data were available were Mexican American, and the relationships of interest to the investigators those relating to English versus Spanish Language skill and reading achievement. They found, however, that the behavior factor of Extraversion correlated more highly than any other variable with word knowledge and reading achievement, .49 and .37 respectively. The correlation between Task Orientation and word knowledge was also high, .39. In the Stedman-Adams study there is only the one pre-

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* -For Positive Task Orientation, the correlation of second grade was .64 and at fourth grade, .56, while the correlations for Extraversion were .33 and .39 respectively.

school rating and therefore no indication of what changes may have occurred in the relationship of behavior factors and achievement longitudinally.

The most thorough investigation of the relationships between preschool social-emotional functioning, measured by behavior factors rating scales, and primary grade achievement has been reported by Martin Kohn and Bernice Rosman (1972 a and b). They have related the factor tapped by the Kohn Problem Checklist and Social Competence behavior rating scales to Schaefer's factors.

The Kohn-identified Factor I, Apathy-Participation, is equated almost directly to Schaefer's Extraversion factor. Their Factor II, Anger-Compliance, is approximately equivalent to Schaefer's Social Behavior and Task Orientation factors. They found very high correlations between their Factor II and the Positive Social Behavior and Positive Task Orientation scales.

Kohn and Rosman computed the relationships between their Factor I and II ratings, done when their subjects were five years old, and achievement at first and second grades. Factor I correlated consistently with achievement in reading measured at the end of the two grades. Thus, in a location across the country from Stedman and Adams, and presumably with substantial cultural differences, Extraversion scores in preschool settings were again found to be related to reading achievement in the early grades. Kohn and Rosman found their Factor II score was not significantly related to first grade achievement, and related significantly only for girls at the end of second grade.

To summarize, Extraversion in preschool and at the beginning of Grade One has been found repeatedly to be of importance to first grade achievement. This is true of our own results, as well as those of Stedman and Adams, and of Kohn and Rosman. Theoretically, as Kohn has stated very clearly, the matter of interest-participation, of being actively involved rather than passive and withdrawn, is the very means for classroom learning.

Task Orientation appears to be more of a school experience related matter. The students of both the Stedman and Adams and the Kohn and Rosman study were rated only at the preschool level for the behavioral factors. Task Orientation at that point was found to have a very limited relationship with the later achievement of the students. When behavior is measured over time, as our study does, Task Orientation takes on an increasingly close relationship with end-of-first-grade achievement measures. The relationship between Extraversion and end-of-first-grade achievement seems to decrease as the year progresses. In the case of Schaefer's results, where the children were measured at the second and fourth grade levels, concurrent ratings for Task Orientation were very high, showing a closer relationship with achievement at both of these grade levels than did Extraversion.

To these results we should add an observation from the Landsberger study of good-readers and non-readers (1976). It was noted that none of the good readers (55 students from the total of about 300) was rated below the mid-point on the bipolar Introversion-Extraversion factor, i.e., not a single one was in the "Introverted" range of the scale according to teacher ratings. This was regarded as suggesting a fundamental role for Extraversion in the early part of the process of learning to read. Extraversion may be a necessary, though it is not a sufficient condition: "not sufficient" because some non-readers were at the Extraverted end of the scale, but had not made a parallel achievement in reading.

The import of the findings from these kinds of investigations appears to be in cumulating evidence that task orientation builds upon an early and fundamental factor of extraversion as learning activities come to include reading instruction, and that task orientation assumes a more prominent relationship with achievement as time goes on.

One pedagogical implication relates to procedures to adopt with non-

readers. If non-reading is motivated, i.e., if avoiding becoming a reader is part of an adjustment to the demands of a classroom where "learning to read" is clearly a goal, further attempts at instructing the child may result only in further avoidance behaviors. Remedial reading activities, especially in the form of more time spent on drill of the same kind the child has had before, may be the last thing to do. If totally different approaches are made to the way the child feels about activities in school through which (s)he can relate positively to classroom goals, then it may be that (s)he will be able to arrive at a commitment to reading activities.

These results could be interpreted to support the relationship between failure to learn to read and the potential development of personality problems: namely, a relationship between reading achievement and mental health. A school related concern for mental health does seem to be indicated by these findings. This topic has been discussed recently in a long and thoughtful chapter by Leon Eisenberg (1975).

In conclusion, there is evidence for the statement that at the very least, children who are not achieving in reading are at risk for becoming more introverted, more hostile in their social behavior and less task oriented after several months in their first grade classrooms than they were at the outset. This is a matter of concern from the standpoint of the public school and student achievement, but more importantly, for the well-being of the children themselves.

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TABLE I

Interscale Correlations Between Pairs of Classroom Inventory Factors
(N = 224-226)

	Positive Social Behavior		Positive Task Orientation	
	r	r^2	r	r^2
Extraversion	.434	.19	.428	.18
Positive Social Behavior			.635	.40

TABLE II

Correlation of the Three Behavior Factors for Each of Four Rating Times With The Paragraph Meaning Stanford Achievement Subtest at the End of First Grade* (N = 211-234)

Behavior Factor	Time When Ratings Were Made							
	Kindergarten				First Grade			
	Beginning		End		Beginning		End	
	r	r^2	r	r^2	r	r^2	r	r^2
Social Behavior	.14	.02	.17	.03	.30*	.09	.26*	.07
Extraversion	.22*	.05	.29*	.08	.46*	.21	.38*	.14
Task Orientation	.24*	.05	.39*	.15	.46*	.21	.46*	.21

*Asterisk indicates significance with p = .001

TABLE III

Multiple Correlations and Percent of Variance Explained (r^2) Between Three Classroom Behavior Factors at Beginning of First Grade and Stanford Achievement Subtests at End of First Grade (N = 114)

Stanford Achievement Tests	Multiple Correlations	r^2 Values for Behavior Factors		
		Positive Task Orientation	Extroversion	Social Behavior
Word Reading	.47	.06	.12	.05
Paragraph Meaning	.58	.10	.20	.04
Vocabulary	.54	.10	.18	.02
Word Study Skills	.59	.09	.19	.04
Arithmetic	.59	.09	.19	.07

TABLE IV

Multiple Correlations and Percent of Variance Explained (r^2) Between Three Classroom Behavior Factors and Stanford Achievement Subtests at End of First Grade (N = 114)

Stanford Achievement Tests	Multiple Correlations	r^2 Values for Behavior Factors		
		Positive Task Orientation	Extroversion	Social Behavior
Word Reading	.45	.17	.03	.00
Paragraph Meaning	.53	.23	.06	.00
Vocabulary	.43	.12	.05	.01
Word Study Skills	.60	.26	.07	.04
Arithmetic	.55	.24	.05	.01

TABLE V

Multiple Correlations and Percent of Variance Explained (r^2) Between Paragraph Meaning Standard Achievement Subtests and Behavior Factor Ratings at Beginning and End of First Grade (N = 114)

Time of Behavior Ratings	Multiple Correlation	Multiple r^2	r^2 Values for Behavior Factors		
			Positive Task Orientation	Extraversion	Social Behavior
Beginning of First Grade	.58	.34	.10	.20	.04
End of First Grade	.53	.28	.23	.06	.00